

## § 164.009-9

- (a) The trade name of the material.
- (b) The thickness or density, or both, of the material, or the range of thicknesses or densities, or both, of the material as manufactured.
- (c) The composition of the material.
- (d) The density and percentage of moisture and volatile matter of each component of the material.
- (e) The address of the factory manufacturing the material.
- (f) A sample representative of the material that is 305 mm long and 305 mm wide and that has a height equal to the largest thickness of the material as manufactured.
- (g) If the applicant intends to observe the test and measurements of the sample, a statement to that effect.
- (h) A commitment by the applicant to pay for the cost of the test and measurements when billed by the designated laboratory.

### § 164.009-9 Procedure for approval.

- (a) An application for approval of a material under this subpart must be sent to the Commandant (CG-ENG), Attn: Office of Design and Engineering Systems, U.S. Coast Guard Stop 7509, 2703 Martin Luther King Jr. Avenue SE., Washington, DC 20593-7509.
- (b) The application is examined by the Coast Guard to determine the probability that the material meets the requirements for approval. The Coast Guard notifies the applicant of the results of the examination and of the sample size necessary for submission to the designated laboratory.
- (c) The designated laboratory notifies the applicant of the time and place for submission and testing of the sample.
- (d) The designated laboratory conducts the tests and measurements of the sample in accordance with the procedures in this subpart, prepares a test report, and sends four copies of the report to the Commandant (CG-ENG). The applicant may observe the test and measurements.
- (e) The Commandant sends a copy of the test report to the applicant and advises him whether the material is approved. If the material is approved, an

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approval certificate is sent to the applicant.

[CGD 74-129, 41 FR 41701, Sept. 23, 1976, as amended by CGD 82-063b, 48 FR 4783, Feb. 3, 1983; CGD 88-070, 53 FR 34537, Sept. 7, 1988; CGD 95-072, 60 FR 50467, Sept. 29, 1995; CGD 96-041, 61 FR 50734, Sept. 27, 1996; USCG-2009-0702, 74 FR 49238, Sept. 25, 2009; USCG-2013-0671, 78 FR 60162, Sept. 30, 2013]

### § 164.009-11 Furnace apparatus.

- (a) The test furnace apparatus consists of a furnace tube, stabilizer, draft shield, furnace stand, temperature coil controls with a voltage stabilizer, specimen holder, specimen insertion device, and three thermocouples (a furnace thermocouple to measure furnace temperature, a surface thermocouple to measure temperature at the surface of a specimen, and a specimen thermocouple to measure temperature at the center of a specimen). A detailed plan of the construction and arrangement of the furnace apparatus may be obtained from the Commandant (CG-521).

- (b) Temperatures measured by the thermocouples are recorded by an instrument having a measuring range that corresponds to the temperature changes that occur during a furnace calibration or test. The temperature recording equipment is accurate to within at least 0.5 percent of temperatures recorded during a test.

[CGD 74-129, 41 FR 41701, Sept. 23, 1976, as amended by CGD 82-063b, 48 FR 4783, Feb. 3, 1983; CGD 95-072, 60 FR 50467, Sept. 29, 1995; CGD 96-041, 61 FR 50734, Sept. 27, 1996; USCG-2009-0702, 74 FR 49238, Sept. 25, 2009]

### § 164.009-13 Furnace calibration.

A calibration is performed on each new furnace and on each existing furnace as often as necessary to ensure that the furnace is in good working order. In each calibration the energy input to the furnace is adjusted so that the furnace thermocouple gives a steady reading of  $750 \pm 10$  °C. The wall temperature of the furnace tube is then measured by an optical micro-pyrometer at intervals of 10mm on 3 equally spaced vertical axes. The furnace is correctly calibrated if the temperature of the furnace tube wall is between 825 and 875 °C. 50 mm above and below the midline of the wall and if the average

wall temperature is approximately 850 °C.

**§ 164.009-15 Test procedure.**

(a) *General.* Paragraphs (b) through (k) of this section contain the test procedures for each material submitted for approval, except fiberglass and other materials that melt at 750° ±10 °C. Paragraph (l) of this section contains test procedures for fiberglass and other materials that melt at 750° ±10 °C.

(b) *Preparation of specimens.* (1) The designated laboratory prepares 5 cylindrical specimens representative of the properties of the sample submitted for testing. The dimensions of each specimen are as follows:

diameter: 45(+2/-0) mm  
height: 50 ±3 mm  
volume: 80 ±5 cm<sup>3</sup>

(2) If the height of the sample, except a composite material, is less than 47 mm, the specimens prepared consist of layers of the sample.

(3) If the sample is a composite material and has a height that is not 50 ±3mm, the layers of the specimen prepared are proportional in thickness to the layers of the sample.

(4) The top and bottom faces of each specimen prepared are the faces of the material as manufactured.

(5) If it is not practicable to prepare a specimen by the procedures described in paragraphs (b)(2) through (b)(4) of this section, the test is performed on five specimens of each component of the sample made to the dimensions prescribed in paragraph (b)(1) of this section.

(c) *Conditioning of specimen.* Each specimen is conditioned for at least 20 hours in a ventilated oven maintained at 60 ±5 °C. and is then cooled to room temperature in a desiccator.

(d) *Weight of specimen.* The weight of each conditioned specimen after cooling is determined before it is tested.

(e) *Placement of specimen in holder.* After a specimen is conditioned and weighed, it is placed in the specimen holder. A specimen that is made of layers of a composite material is held firmly together in the specimen holder.

(f) *Attachment of thermocouples.* After the specimen is placed in the specimen holder, the thermocouples are attached

to the specimen as follows: A vertical hole with a diameter of 2 mm and a depth that is half the height of the specimen is made in the center of the top of the specimen. The specimen thermocouple is then inserted into the hole so that its hot junction is at the center of the specimen. The surface thermocouple is put in contact with the surface of the specimen at its mid-height.

(g) *Preparation of the apparatus.* The apparatus is examined to determine whether it is in good working order and to ensure that the equipment is protected against drafts and is not exposed to direct sunlight or artificial illumination. The furnace temperature is stabilized at 750 °C. ±10 °C. and kept at that temperature for the duration of the test. The furnace temperature is stabilized when no adjustments are needed in the energy input to the furnace to keep the temperature constant.

(h) *Insertion of specimen.* After the furnace temperature is stabilized for at least 10 minutes, the specimen is inserted into the furnace. The insertion is completed within 5 seconds. The specimen is positioned so that the hot junction of the surface thermocouple is diametrically opposite the hot junction of the furnace thermocouple.

(i) *Heating period.* The heating period begins upon insertion of the specimen into the furnace and continues for 20 minutes, or until peak temperatures have passed.

(j) *Test observations.* Temperature measurements at each thermocouple are made at intervals of not more than 10 seconds during the heating period, and note is taken of the occurrence and duration of any flaming. At the end of the heating period, the specimen is removed from the furnace and weighed while still hot.

(k) *Test results.* Material is approved under this subpart if the test results of the sample submitted are within the following limits:

(1) The highest temperature recorded for each specimen during the test by the furnace thermocouple, when averaged with the highest temperatures recorded for the other specimens, is not more than 50 °C. above the stabilized furnace temperature.